

Description of the Holotypes of Aedes (Finlaya) purpureus
and Ae. (Fin.) pecuniosus with a Revalidation
of the Latter Species (Diptera: Culicidae)

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ABSTRACT. Detailed descriptions of the adult female holotypes of Aedes (Finlaya) purpureus (Theobald) and Ae. (Fin.) pecuniosus Edwards are provided. Illustrations of the female genitalia of the two holotypes are included. Aedes pecuniosus is resurrected from synonymy and its distinguishing features are listed.

INTRODUCTION

Molpemyia purpurea was originally described by Theobald in 1910 from a single female. Taylor in 1914 described Calomyia priestleyi also from a single female. Later, Edwards (1922) described Aedes (Finlaya) pecuniosus, again from a single female, compared it to the previously described two species, and considered the three to form a very distinct group but probably specifically distinct. Taylor (1944) placed priestleyi and pecuniosus in synonymy with purpureus. This synonymy was maintained by subsequent authors (e.g., Knight and Marks 1952; Marks 1955; Stone et al. 1959; Knight and Stone 1977; and Lee et al. 1982).

During studies on species in the subgenus Finlaya Theobald I noted that there appeared to be two distinct species among specimens previously determined as purpureus. This was confirmed when I examined the holotypes of purpureus, priestleyi and pecuniosus. Therefore, purpureus and pecuniosus are considered as distinct species and their holotypes are described below. Aedes priestleyi is considered conspecific with purpureus and is included as a synonym.

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²The views of the author do not purport to reflect the positions of the Department of the Army or the Department of Defense.

Nomenclature used in the descriptions of the female adult follows Harbach and Knight [1980, 1981(1982)] and terminology of the female genitalia follows Reinert (1974). In the synonymy sections, an asterisk following the abbreviations used (A = adult, F = female, M = male and L = larva) indicates that at least some portion of that sex or stage is figured.

DESCRIPTIONS

The following descriptions of Ae. purpureus and Ae. pecuniosus are based on the holotype specimens of these two species.

AEDES (FINLAYA) PURPUREUS (THEOBALD) (Fig. 1)

- Molpemyia purpurea Theobald 1910: 479 (F).
Ochlerotatus purpureus of Edwards 1912: 523.
Ochlerotatus (?) purpurea of Brunetti 1914: 65; Senior-White 1923: 74.
Calomyia priestleyi Taylor 1914: 684 (F).
Aedes (Finlaya) priestleyi of Edwards 1932: 153.
Aedes (Finlaya) purpureus of Edwards 1932: 153; Taylor 1944: 122 (in part); Knight 1948: 2 (in part); Knight and Marks 1952: 565 (in part); Marks 1955: 26 (in part); Stone et al. 1959: 169 (in part); Knight and Stone 1977: 102 (in part); Lee et al. 1982: 236 (in part).

FEMALE. Head. Antenna dark brown, 0.93 length of proboscis, pedicel dark reddish-brown with several short dark setae mesally; maxillary palpus long, scales blackish-brown with a violet hue, 0.25 length of proboscis; clypeus dark reddish-brown, bare; proboscis narrow, scales blackish-brown with a violet hue, 1.11 length of femur I; vertex and occiput covered with narrow curved white scales and numerous long brown erect forked scales, ocular line with narrow curved white scales and extending onto interocular space, interocular and ocular setae dark reddish-brown, postgena with broad decumbent scales, scales next to vertex and along posterior margin of eye pale brownish-white, remainder of scales brown; eyes contiguous.
Thorax. Both left and right sides of notum partially rubbed, especially the scutal fossal areas; integument dark blackish-brown; notum covered with narrow curved dark reddish-brown scales (including entire area between acrostichal setae) except for the following areas: a few broad silvery scales on posterior scutal fossal area (remainder of scutal fossal area with scales missing), posterior medial scutal area with a few narrow curved white scales, prescutellar area with a

double row of short broad overlapping silvery scales on anterior and lateral margins, a narrow stripe of narrow curved white scales on posterior dorsocentral area laterad to setae, 2 small to medium sized patches of broad overlapping silvery scales on supraalar area (patches separated by a rubbed area and preceded by the rubbed antealar area); setae blackish-brown, well developed and as follows: 4 median anterior promontory, numerous acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (6 anterior, 3, 4 lateral, 2, 3 median and 0, 1 posterior), several antealar, a number on supraalar and prescutellar, and one parascutellar; scutellum with a patch of broad overlapping silvery scales on each lobe, lateral lobes also with a few narrow curved white and brown scales on posterolateral areas, long and short dark reddish-brown setae as follows (some rubbed off but alveoli present), 12, 16 on lateral lobes and 9 on median lobe; mesopostnotum bare; pleural integument dark blackish-brown; anteprenotum with broad overlapping silvery scales, several dark setae; postpronotum with numerous short broad overlapping silvery scales which probably cover most of surface (area rubbed), 7, 8 dark posterior setae; postspiracular area without scales, 6, 10 brown setae; paratergite covered with short broad overlapping silvery scales; subspiracular area bare; proepisternum with an upper patch of short broad overlapping silvery scales, several golden-brown setae, lower area bare; mesokatepisternum with a large upper and a small lower patch of short broad overlapping silvery scales, 3, 4 upper and 9, 10 lower posterior setae; prealar area with a moderate sized patch of short broad overlapping silvery scales on lower area and extending onto upper area, prealar knob with 11 dark setae; mesepimeron with a large patch of short broad overlapping silvery scales covering most of area, 17, 19 golden-brown upper setae, lower setae absent; metameron and mesopostnotum bare. Legs. Right front and both hindlegs missing; coxae I-III each with a large patch of broad overlapping silvery scales, several setae; trochanters I-III each with a patch of brown scales, several short setae; femora I and II blackish-brown scaled with a patch of creamy-brown scales on posterobasal areas, II also with a small dorsoapical patch of white scales; tibiae I and II blackish-brown scaled; tarsi I and II blackish-brown scaled but I also with a broad snowy-white scaled subbasal band on basal 0.38 of tarsomere 1 (an indistinct very small basal band of blackish-brown scales) and basal 0.44 of tarsomere 2, II with a broad snowy-white scaled subbasal band on basal 0.42 of tarsomere 1 (an indistinct very small basal band of blackish-brown scales) and basal 0.48 of tarsomere 2, and a small dorsobasal snowy-white scaled spot on tarsomere 3, remainder of tarsomeres dark scaled; posttarsi I and II each with 2 ungues, equal in size, both with a tooth. Wing. Dorsal and ventral veins dark brown scaled except for 2 white scales on anterior

surface of costa near base of right wing; alula with a row of narrow dark brown scales on posterior margin; 0, 2 remigial setae; upper calypter with a row of long golden setae on margin. Halter. Pedicel pale brown, capitellum white scaled. Abdomen. Terga blackish-brown scaled, scales with a violet reflection, I-VI also with a large laterobasal patch of silvery scales, I with a large patch of silvery scales covering most of tergum, II with a dorsobasal silvery scaled band which connects with laterobasal patches, III-VI with a dorsobasal silvery scaled band not connecting to laterobasal patches (terga III-VI badly rubbed), remainder of abdomen removed with genitalia; sterna badly rubbed but most sterna appear to be primarily covered with broad silvery scales with broad brown scales on posterior areas; tergum I with a large patch of golden setae on lateral and posterior areas, numerous short dark or light brown setae on lateral and posterior margins of terga and sterna. Genitalia (Fig. 1). Tergum VIII with basal 0.65 retracted into segment VII, covered with minute spicules, heavily pigmented, base gently concave, laterobasal corners rounded, apex rounded, numerous broad scales on apical 0.7 (many scales rubbed off), several short to moderately long setae on apical 0.58, many of these stout judging by the size of the alveoli of missing setae, apical margin also with several stout long setae (setae missing but alveoli present), basolateral seta present, VIII-Te index 0.7, VIII-Te/IX-Te index 2.18, length 0.47 mm, width 0.67 mm; sternum VIII covered with minute spicules, heavily pigmented, base slightly concave mesally, apex straight, several broad and a few narrow scales on approximately lateroapical 0.6, numerous short setae covering apical 0.93 except for laterobasal areas, a number of short setae on apical area flattened and with apical portion curved, setae 1-3-S not distinguished, however, several long setae spaced along a submedian area on both sides of midline, a subapical line of 4 moderately long to long setae extending in a gradually sloping line posteromesally from lateroapical corner, setae increase slightly in length mesally, basolateral seta absent, apical intersegmental membrane nonpigmented, intersegmental membrane between segments VII and VIII short, VIII-S index 0.65, length 0.57 mm, width 0.88 mm; tergum IX covered with minute spicules, heavily pigmented, median apical area lightly pigmented, apex with a moderately deep U-shaped median indentation, 5, 6 moderately long setae apically on each side of midline, 11 total setae, base slightly concave, narrow, lateral margins slightly bowed, IX-Te index 0.89, length 0.22 mm, width 0.24 mm, dorsal spheres present; insula covered with minute spicules, moderately pigmented with heavily pigmented area occupied by setae, lip-like, 15 short setae; lower vaginal lip covered with short spicules, moderately pigmented, moderately wide, lower vaginal sclerite absent, ventral tuft present; upper vaginal lip covered with short spicules, heavily pigmented,

caudal margin broadly rounded, upper vaginal sclerite heavily pigmented, large; spermathecal eminence membranous, nonpigmented, somewhat mushroom-shaped caudally with basal area covered with densely packed short thin simple spermathecal eminence spicules which are directed mesally; postgenital lobe covered with moderately long curved spicules, those along base and lateral margins stouter, moderately long, apical portion narrow, apex sharply rounded, basal area wide with a swollen appearance and separated basomesally by a heavily pigmented circular basal mesal apodeme, 19, 21 setae on each side of midline, 40 total setae, ventral PGL/cercus index 0.71, dorsal PGL index 1.71, ventral PGL index 2.56, ventral length 0.27 mm; proctiger with small groups of minute spicules scattered over entire area, membranous; cercus covered with short spicules, those on lateral margins stout and longer, moderately long, moderately wide apically and broad basally, inner margin nearly straight except slightly bowed basally, apex bluntly rounded, dorsal surface without scales, 9 moderately long or long stout setae on apical margin and apical area, numerous short and moderately stout setae on apical 0.69, several short and somewhat flattened setae with curved apices along apex and distal portions of lateral and mesal margins, ventral surface with several short setae on apical and lateroapical areas, cercus index 2.63, cercus/dorsal PGL index 2.10, length 0.38 mm, width 0.14 mm; one large and 2 medium sized spermathecal capsules, heavily pigmented, spherical, a patch of numerous small spermathecal capsule pores near orifice, accessory gland duct base moderately pigmented.

AEDES (FINLAYA) PECUNIOSUS EDWARDS
(Fig. 2)

Aedes (Finlaya) pecuniosus Edwards 1922: 94 (F); Cooling 1924: 24 (A*, F, M*, L*); Edwards 1932: 153; Lee 1944: 65 (L*); Aedes (Finlaya) purpureus of Taylor 1944: 122 (M* ?) (in part); Knight 1948: 3 (in part); Knight and Marks 1952: 566 (in part); Marks 1955: 26 (in part); Stone et al. 1959: 169 (in part); Knight and Stone 1977: 102 (in part); Lee et al. 1982: 236 (in part).

FEMALE. Head. Antenna dark brown, pedicel blackish-brown with a few short dark setae mesally (left antenna and pedicel and apical flagellomere of right antenna missing); maxillary palpus long, with scales blackish-brown with a violet hue, 0.3 length of proboscis; clypeus blackish-brown, bare; proboscis narrow, with scales blackish-brown with a violet hue, 1.11 length of femur I; vertex and occiput covered with narrow curved white scales and numerous long brown erect forked scales, ocular line with narrow curved white scales, similar scales extending onto interocular

space, interocular and ocular setae golden colored except for lateral 2 ocular setae which are dark brown, postgena with broad decumbent scales, scales next to vertex and along posterior margin of eye pale brownish-white, remainder of scales dark brown and those on posterior area blackish-brown; eyes contiguous.

Thorax. Both left and right sides of notum partially rubbed; integument dark blackish-brown; notum covered with narrow curved dark reddish-brown scales except for areas of short broad overlapping silvery-white scales as follows: a stripe of 4 scales abreast from median anterior promontory area for a short distance posteriorly and continuing posteriorly as a stripe of 2 abreast scales on the acrostichal area to posterior median scutal area where it forms a medium sized patch and then continues posteriorly as a 2 to 3 abreast stripe on lateral margins of prescutellar area to scutellum, a large triangular patch covering scutal fossal area (part of lateral area rubbed, but scales appear to cover entire area), narrow stripe (single row of scales) on posterior dorsocentral area laterad to setae, appears to be a small antearlar patch (area rubbed), and a medium sized supraalar patch (these 2 patches could possible be contiguous); setae blackish-brown, well developed and as follows: (some setae missing but setal alveoli present), 3 median anterior promontory, acrostichal (a few anterior, 2 at middle and one posterior), several dorsocentral (anterior and posterior), scutal fossal (7 anterior, 3, 5 lateral, 3 posterior), a few antearlar, several supraalar and prescutellar, and one parascutellar; scutellum with a patch of short broad overlapping silvery-white scales on each lobe, long golden-brown and short brown setae as follows (some rubbed off but alveoli present), 9, 10 on lateral lobes and 10 on median lobe; mesopostnotum bare; pleural integument dark reddish-brown; anteprepronotum with short broad overlapping silvery scales, several dark setae; postpronotum covered with short broad silvery scales, 4, 5 dark posterior setae; postspiracular area without scales, 5, 6 brown or golden setae; paratergite covered with short broad overlapping silvery scales; subspiracular area with an elongate patch of short broad overlapping silvery scales, setae absent; proepisternum with an upper patch of short broad overlapping silvery scales, 6, 7 golden setae, lower area bare; mesokatepisternum with a large upper and a small lower patch of short broad overlapping silvery scales, 3 upper and 9, 10 lower posterior setae; prealar area with a moderate sized patch of short broad overlapping silvery scales on lower area and extending onto upper area, prealar knob with 9 setae; mesepimeron with a large patch of short broad overlapping silvery scales covering most of area, 8, 9 golden-brown upper setae, lower setae absent; metameron with a patch of short broad overlapping silvery scales, setae absent.

Legs. Coxae I-III each with a large patch of short broad overlapping silvery scales, several setae; trochanters I-III each

with brown scales, several short setae; femur I dark blackish-brown scaled with an indistinct posterodorsal stripe of pale brown scales on basal area, femur II dark blackish-brown scaled with a small dorsoapical snowy-white scaled patch and an indistinct posteroventral stripe of dusty-white scales on basal area, femur III dark blackish-brown scaled with a small dorsoapical snowy-white scaled patch and a broad band of white scales on approximately basal 0.25; tibiae I-III blackish-brown scaled; tarsi blackish-brown scaled, I also with a broad snowy-white scaled subbasal band on basal 0.3 of tarsomere 1 (a very small basal band of blackish-brown scales) and on basal 0.5 of tarsomere 2, II with a broad snowy-white scaled subbasal band on basal 0.5 of tarsomeres 1 (a very small basal band of blackish-brown scales) and on basal 0.5 of tarsomere 2 (remainder of tarsomeres missing), III with a broad snowy-white scaled subbasal band on basal 0.3 of tarsomere 1 (a very small basal band of blackish-brown scales) and on basal 0.3 of tarsomeres 2 and 3, a small dorsobasal snowy-white scaled spot on tarsomere 4, tarsomere 5 completely dark scaled; left legs I and II missing; posttarsi I and III each with 2 ungues, I with ungues equal in size, both with a tooth, III with ungues equal in size, both simple. Wing. Dorsal and ventral veins dark brown scaled except for an elongate patch of creamy-white scales on anterior margin of costa basad of humeral crossvein; alula with a row of narrow dark brown scales on posterior margin; no remigial setae seen; upper calypter with a row of long golden setae on margin. Halter. Pedicel pale brown, capitellum white scaled. Abdomen. Terga blackish-brown scaled, scales with a violet reflection, I-VI also with a large laterobasal patch of silvery scales, I with a large patch of silvery scales covering most of tergum (tergum badly rubbed), II and III with a narrow dorsobasal silvery scaled band connecting to laterobasal silvery scaled spots, IV-VI appear to have indistinct narrow dorsobasal silvery scaled bands (terga of all segments rubbed), remainder of abdomen removed with genitalia mount; sterna silvery scaled, III-VI also with glossy brown scales on posterior margin covering a triangular median area and increasing in size on each succeeding sternum; tergum I with a large patch of golden setae on dorsal surface, numerous short dark or golden setae on lateral and posterior margins of terga and sterna. Genitalia (Fig. 2). Tergum VIII with basal 0.6 retracted into segment VII, covered with minute spicules, heavily pigmented, base gently concave, laterobasal corners rounded, apex rounded, numerous short broad scales on apical 0.65, scales on distal area somewhat longer (a number of scales rubbed off), setal alveoli on apical 0.38 (setae missing) indicating, by their size, that a number of short to moderately long setae occur on proximal area and several long to very long stout seta along apical margin, basolateral setae present, VIII-Te index 0.76, length 0.47 mm, width 0.61 mm;

sternum VIII covered with minute spicules, heavily pigmented, base slightly concave mesally, apex straight, a large patch of short broad scales (a few moderately broad scales distally) on apical 0.66 and covering most of lateral area but not on median line, numerous short and a few moderately long setae on apical 0.9, a number of setae on distal area flattened and with apical portion curved, setae 1-3-S not distinguished, however, several long setae spaced along a submedian area on both sides of midline, a subapical line of 4 moderately long to long setae extending in a gradually sloping line posteromesally from lateroapical corner, setae increase slightly in length mesally, basolateral setae present, apical intersegmental membrane nonpigmented, intersegmental membrane between segments VII and VIII short, VIII-S index 0.66, length 0.59 mm, width 0.90 mm. When terminal abdominal segments of the holotype were removed for the genitalia preparation it was discovered that the genitalia were completely absent and there was no evidence of either internal or external genital parts, therefore only the features of segment VIII could be described and illustrated for the holotype.

DISCUSSION

The following characters can be used to easily separate adult females of the two species: Ae. purpureus possesses subspiracular area bare, acrostichal area with only narrow curved scales, ocular and interocular setae dark reddish-brown, and sternum VIII with a small patch of scales on lateral areas, while Ae. pecuniosus possesses subspiracular area with an elongate patch of short broad overlapping silvery scales, acrostichal area with a stripe of two abreast short broad overlapping silvery-white scales extending the entire length, ocular and interocular setae golden except for lateral two ocular setae which are dark brown, and sternum VIII with a large patch of short broad scales covering most of lateral areas. Additionally, the specimens that I examined of Ae. purpureus had the scutellum with a few narrow curved scales on the posterolateral areas of the lateral lobes in addition to the broad overlapping silvery scales while Ae. pecuniosus had only broad overlapping silvery scales on the scutellum. Other differences are included in the above descriptions of the two species.

Cooling (1924), in a footnote, indicated that he had initially intended to publish his description of Ae. pecuniosus under a new name, Aedes (Finlaya) priestleyi hamadryadis; however, after reading Edwards' (1922) description of Ae. pecuniosus he felt the two were probably conspecific. Like Lee et al. (1982) and Ward (1984), I feel that since the name hamadryadis appears only in a manuscript (which was recalled by

Cooling prior to publication) and in a footnote explaining his actions, it should not be regarded as a synonym even though it is listed as such by Edwards (1932), Knight (1948), Knight and Marks (1952), Marks (1955), Stone et al. (1959) and Knight and Stone (1977). I have examined five adult males, deposited in the Australian National Insect Collection, CSIRO, that appear to be the series used by Cooling (1924). These specimens possess the following information on the labels: Derby, W. Australia, L. C. Cooling; 384, 385, 386, 387 (specimen numbers); and Derby, W. Australia, D. A. H. Boldwin; 388. All five specimens are Ae. pecuniosus.

For a complete listing of literature (including biology and distribution) concerning these two species see Marks (1955) and Lee et al. (1982).

TYPE DATA

The holotype female adult of purpureus contains the following information on labels attached to the pin: HOLOTYPE (small circular white label with a red border); Stannary Hills, Queensland, Dr. Bancroft (white circular label); Molpemyia purpurea, n. sp. F (female symbol), Type, F.V.T. (white circular label); 1909-272 (small rectangular label); and T87.6 Term. (small rectangular label with genitalia preparation number). The adult is mounted on a minuten pin inserted through venter of thorax between the legs and exits through the notum behind the right wing and is stuck in a rectangular piece of cork attached to an insect pin. The genitalia are mounted in Canada balsam under a circular cover glass on a glass microscope slide. The holotype is deposited in the British Museum (Natural History) (BMNH), London, United Kingdom.

The holotype female adult of pecuniosus contains the following information on labels attached to the pin: HOLOTYPE (small circular white label with a red border); Aedes (Finlaya) pecuniosus, Edw. (white rectangular label); Port Darwin, N. Territory, S. Australia, C. L. Strangman (Pres. by Col. A. Cock) (white rectangular label); and T87.13 Term. (small rectangular label with genitalia preparation number). The adult is mounted on a minuten pin inserted through venter of thorax between the legs and exits through the notum at the posterior medial scutal area and is stuck in a rectangular piece of cork attached to an insect pin. The genitalia are mounted in Canada balsam under a circular cover glass on a glass microscope slide. The holotype is deposited in the BMNH.

The holotype female adult of priestleyi contains the following information on labels attached to the pin: Type,

Calomyia priestleyi Taylor (white rectangular label); 397 (small white rectangular label); Townsville, Queensland, Dr. H. Priestley, 27-3-13 (white rectangular label); and T88.1 Term. (small white rectangular label with genitalia preparation number). The genitalia are mounted in Canada balsam under a circular cover glass on a glass microscope slide. The holotype is deposited in the Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organization (CSIRO), Canberra, Australia.

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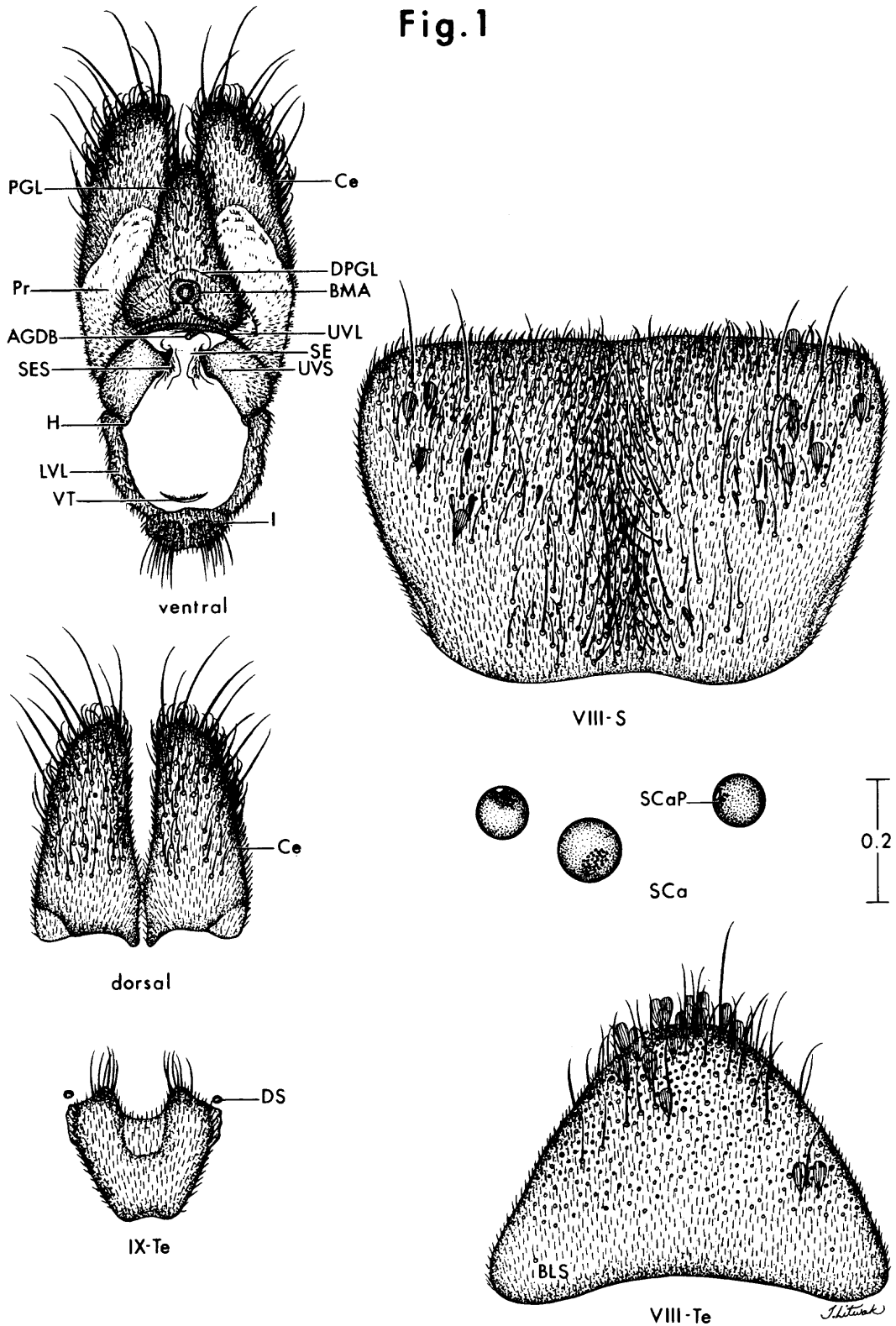
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LIST OF FIGURE ABBREVIATIONS

Female Genitalia

AGDB	=	Accessory gland duct base
BMA	=	Basal mesal apodeme
Ce	=	Cercus
DPGL	=	Line of attachment of proctiger to dorsal surface of PGL
DS	=	Dorsal sphere
H	=	Hinge
I	=	Insula
IX-Te	=	Tergum IX
LVL	=	Lower vaginal lip
PGL	=	Postgenital lobe
Pr	=	Proctiger
SCa	=	Spermathecal capsule
SCaP	=	Spermathecal capsule pore
SE	=	Spermathecal eminence
SES	=	Spermathecal eminence spicule
UVL	=	Upper vaginal lip
UVS	=	Upper vaginal sclerite
VIII-Te	=	Tergum VIII
VIII-S	=	Sternum VIII
VT	=	Ventral tuft

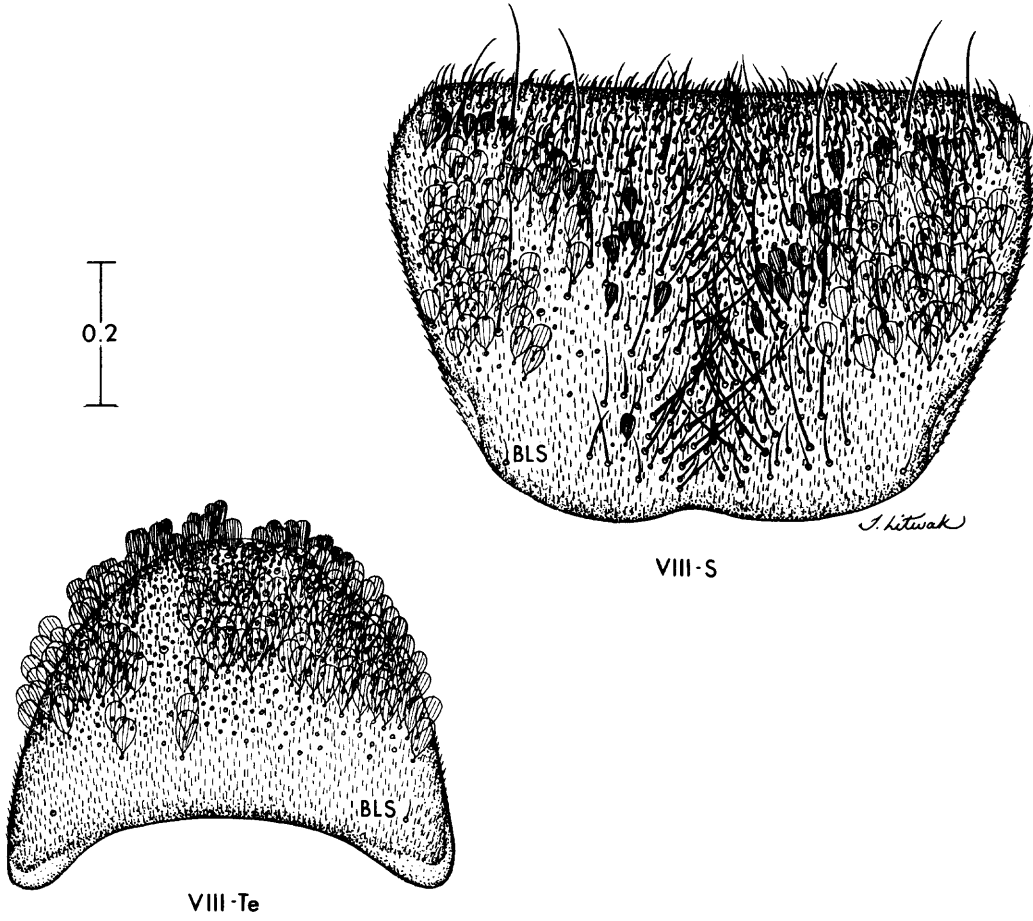
Fig.1



Aedes (Finlaya) purpureus

HOLOTYPE (slide T87.6)

Fig. 2



Aedes (Finlaya) pecuniosus
HOLOTYPE (slide T87.13)